32. (New) The process of claim 28 wherein said supercritical fluid comprises up to 20 wt % of an organic solvent.

33. (New) The process of claim 28 wherein said reacting occurs at a pressure between 80 to 450 bar and at a temperature between 70 to 250 °C.

34. (New) The process of claim 28 that is a batchwise process or a continuous process.

35. (New) The process of claim 28 wherein depressurizing the supercritical fluid causes a volatile accompanying substance to separate from said polymer powder.

36. (New) The process of claim 29 wherein an additional depressurization step purifies said phase I prior to said depressurizing.

37. (New) The process of claim 36 wherein said additional depressurization step is a counter-current extraction process using a supercritical fluid.

38. (New) The process of claim 29 wherein said phase II is separated and recycled into said reacting.

39. (New) The process of claim 38 wherein the supercritical fluid is separated from said phase II before said supercritical fluid is recycled into said reacting.

40. (New) A process for preparing a powder coating comprising:

(a) forming a polymer powder using the process of claim 28; and

(b) processing said polymer powder to form said powder coating.

41. (New) The process of claim 40 wherein said powder coating is formed using an extrusion process, an ultrasonic atomization method, a supercritical fluid, or a steam assisted micronization.

42. (New) The process of claim 41 that further comprises the addition of at least one of a hardener, powder coating additive, dye, pigment, and extender.

43. (New) A process for preparing a powder coating comprising:

reacting in a homogeneous phase at least two copolymerizable ethyllenically unsaturated monomers with an initiator, said reacting occurring in a supercritical fluid, to form a reaction mixture;

adding additional supercritical fluid or altering the temperature or pressure of the reaction mixture to form at least two phases, a phase I containing predominantly polymer and supercritical fluid and a phase II containing predominantly unreacted monomers and supercritical fluid;

separating said phase I from said phase II; and

processing said phase I by adding additional components of a powder coating to form a phase I process mixture; and

converting the phase I process mixture to said polymer powder by depressurizing and removing the supercritical fluid from the process mixture.

44. (New) The process of claim 43 wherein said separated phase I undergoes a further step of separating accompanying substances.

45. (New) The process of claim 43 wherein said additional components include a hardener that reacts with functional groups of the polymer prior to said processing.

46. (New) The process of claim 43 wherein further additives are added to the process mixture.

47. (New) The process of claim 43 wherein said additional components, before being added, are homogenized in a super critical fluid.

48. (New) The process of claim 43 wherein the process mixture is sprayed by a nozzle into a spray tower or a liquid.

49. (New) The process of claim 48 wherein said liquid is an aqueous medium.

50. (New) The process of claim 48 wherein the super critical fluid that is gaseous after spraying is purified and recycled in said process.

51. (New) The process of claim 43 wherein said reacting comprises at least three copolymerizable ethylenically unsaturated monomers, wherein at least one monomer additionally contains further reactive functional groups, and wherein the dispersity of the polymer is < 3.

52. (New) A powder coating prepared by the process of claim 51, wherein said powder coating has an average particle size below 50 µm.

53. (New) The powder coating of claim 52 that is a powder clear coat.

54. (New) The powder coating of claim 53 that is colored with at least one of a pigment or a dye.